

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A Fixed-Delay Tree Search with Decision Feedback (FDTS/DF) equalizer, comprising:

a feed-forward filter receiving and filtering a sampled signal;

a feed-back filter filtering a restored data;

a subtractor ~~obtaining a difference between~~ subtracting signals respectively filtered by the feed-forward filter and the feed-back filter; and

a detector receiving the subtracted signal and detecting a data using an absolute value calculation,

wherein the detector comprises:

a plurality of branch metric calculating units obtaining an error between the subtracted signal and a reference signal, wherein the reference signal is time-variant and is determined by the feed-back filter and by an original data detected by the detector;

an adder adding the values outputted from the plurality of branch metric calculating units;

a path metric memory storing the added value;

a minimum value calculating unit calculating a minimum value of the accumulated values; and

a comparator comparing the minimum values and outputting a most minimum value, and

wherein the plurality of branch metric calculating units comprise:

a plurality of absolute value calculating units obtaining an absolute value of a

difference between the subtracted signal and the reference signal;

a demultiplexer demultiplexing the absolute value outputted from the plurality of absolute value calculating units; and  
an adding unit adding the demultiplexed value outputted from the demultiplexer and a path metric value prior to a one period of sampling time.

2. (Original) The equalizer of claim 1, wherein the feed-forward filter changes the sampled signal to a causal signal.

3. (Original) The equalizer of claim 1, wherein the feed-back filter removes an intersymbol interference of the causal signal.

4. (Canceled)

5. (Previously Presented) The equalizer of claim 1, wherein the plurality of branch metric calculating units are sequentially delayed as deep as  $\tau$  from '0', respectively.

6. (Canceled)

7. (Currently Amended) A Fixed-Delay Tree Search with Decision Feedback (FDTDS/DF) equalizer restoring a data signal passing through a channel, the FDTDS/DF equalizer comprising:

an equalizer making a sampled data signal to be a causal signal and removing an intersymbol interference of the causal signal; and

a detector detecting an original data from the signal without the intersymbol interference by using absolute value calculation,

wherein the detector comprises:

a plurality of branch metric calculating units obtaining an error between the subtracted signal and a reference signal, wherein the reference signal is time-variant and is determined by a feed-back filter and by the original data detected by the detector;

an adder adding the values outputted from the plurality of branch metric calculating units;

a path metric memory storing the added value;

a minimum value calculating unit calculating a minimum value of the accumulated values; and

a comparator comparing the minimum values and outputting a most minimum value, and

wherein the branch metric calculating units comprise:

a plurality of absolute value calculating units obtaining an absolute value of a difference between the subtracted value and the reference signal;

a demultiplexer demultiplexing the absolute value outputted from the plurality of absolute value calculating units; and

an adding unit adding the demultiplexed value outputted from the demultiplexer and a path metric value prior to a one period of sampling time.

8. (Canceled)

9. (Previously Presented) The equalizer of claim 7, wherein the plurality of branch metric calculating units are sequentially delayed as deep as  $\tau$  from '0', respectively.

10. (Canceled)

11. (Currently Amended) A data restoring method of a Fixed-Delay Tree Search with Decision Feedback (FDTS/DF) equalizer, said method comprising:

obtaining a difference between subtracting signals respectively filtered by a feed-forward filter and a feed-back filter;

computing an error through an absolute value calculation between the subtracted signal difference and a reference signal, wherein the reference signal is time-variant and is determined by the feed-back filter and by an original data detected by a detector;

delaying the error as deep as  $\tau$  and adding them;

storing the added results; and

obtaining a minimum value of the stored error value and obtaining a path according to the minimum value;

obtaining an absolute value of a difference between the subtracted signal and the reference signal;

demultiplexing the absolute value; and

adding the demultiplexed value and a path metric value prior to a one period of

sampling time.

12. (Previously Presented) The method of claim 11, wherein, in the path obtaining step, only a branch metric containing a selected path is left while remaining branch metrics are discarded.

13. (Currently Amended) A Fixed-Delay Tree Search with a Decision Feedback (FDTS/DF) equalizer, comprising:

a feed-forward filter receiving and filtering a sampled signal;

a feed-back filter filtering a restored data;

a subtractor disposed between the feed-forward and feed-back filters and obtaining a difference between signals respectively filtered by the feed-forward filter and the feed-back filter; and

a plurality of absolute value calculating units disposed after the subtractor and obtaining an absolute value of the difference between the subtracted value and a reference signal, wherein the reference signal is time-variant and is determined by the feed-back filter and by an original data detected by a detector; and

a demultiplexer demultiplexing the signal absolute value outputted from the absolute value calculating units; and

an adding unit adding the demultiplexed value outputted from the demultiplexer and a path metric value prior to a one period of sampling time.

14. (Previously Presented) The equalizer of claim 13, further comprising:  
an adder adding the values outputted from the demultiplexer;  
a path metric memory storing the added value;  
a minimum value calculating unit calculating a minimum value of the accumulated  
values; and  
a comparator comparing the minimum values and outputting the most minimum value.

15. (Previously Presented) The equalizer of claim 13, wherein the feed-forward filter  
changes the sampled signal to a causal signal.

16. (Previously Presented) The equalizer of claim 13, wherein the feed-back filter  
removes an intersymbol interference of the causal signal.

17. (Previously Presented) The equalizer of claim 13, wherein the plurality of absolute  
value calculating units are sequentially delayed as deep as  $\tau$  from '0', respectively.